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Fern Notes

S. FRED PRINCE

I. A FEBRUARY FERN TRIP.—Since my return to the "Cave Region" in the Ozarks of Southern Missouri, I have been trying to reestablish the stations for the ferns listed by me in the Fern Bulletin some years ago.¹

This has not been easy, as great changes have taken place in the past fifteen years, much of the timber having been removed, many new clearings made, and overstocking on a free open range as well as frequent firing having destroyed much of the wild growth which was found here years ago. In addition, a series of excessively dry years and the denuding action of the very heavy rains common here in winter and spring have very greatly modified the flora of the region.

I have found several species not in my old list, new stations for others, several new varieties, and what I believe are two new species, which I hope soon to place before the Society.

On the 27th day of February last I had a notable fern trip, accompanied by my five-year-old boy, who is as enthusiastic a fern-lover as his father.

We made a circuit down one great ravine and back up another—the distance was short of two miles—time, three hours. From our home on top of the hill to the lowest point was about 350 feet—highest elevation 1200 feet.

The trend of the ravines was southeast.

We found eleven species of ferns in their winter or resting condition, one, the Gray Polypody, new to this part of the country. We have searched closely for miles but have found it nowhere else.

The plants were growing on top of a great boulder in the bottom of a narrow ravine, with mosses, lichens,

¹ Ferns of the cave region of Stone County, Missouri. Fern Bull. 12: 72-77. 1904.

Camptosorus, spleenworts, etc. They were so small and dry, their fronds all curled up (many were not half an inch long), they could scarcely be distinguished from the lichens among which they grew. One plant was particularly interesting. It had the largest fronds (up to $4\frac{1}{2}$ inches long); its branching rhizomes had climbed spirally up the base of a small dead tree to the height of twelve or fourteen inches, appearing so much like a vine with dead-looking leaves, that it could easily have been overlooked.

We have visited the locality several times since, and find that the polypody unfolds and flattens out its fronds during damp or rainy weather, appearing to go on with its business of growing, only to curl up again when dry conditions return.

We found *Cheilanthes lanuginosa* growing in the hollows and crevices of a low cliff in the greatest profusion. It also presented a very dead and dried-up appearance, except in moist weather when it would spread out flat in dense rosettes and become a thing of beauty. The habits of these two ferns would seem to indicate very dry conditions, but with them, on the same rocks, grew also *Cystopteris*, *Woodsia*, and *Camptosorus*!

Pellaea atropurpurea is the common fern here, growing everywhere, even sometimes in the ground, which is very stony. The fertile fronds which were formed last summer and fall are mature, and the sterile fronds growing lustily. There was one large colony, in all stages from prothallia to bare stems of ancient plants, growing in the hollow of an old log, which had a few inches of earth in it.

The sterile fronds of *Woodsia obtusa* and *Cystopteris fragilis* made patches of lively green in the crevices, and *Camptosorus* covered many of the boulders with a dense mat of green. With it, as usual, were the two

spleenworts, *Asplenium ebeneum* and *A. parvulum*, both still carrying their fruiting fronds, which were badly dilapidated, however, the small sterile fronds forming flat rosettes around them. A steep, sloping bank was carpeted for many square yards with the Christmas Fern. There were also three plants of *Asplenium trichomanes*.

We dug up a lot of *Ophioglossum Engelmanni* plants "just to see," and found they were getting ready for the first warm, wet weather.

II. OPHIOGLOSSUM ENGELMANNI.—In March, 1915, I was very much surprised and delighted to come upon a colony of, perhaps, 100 plants of this fern, which, with all my hunting, I had never before found. Before the day's trip was over, I had found it in more than a hundred places, growing on the glades where the soil is sometimes not over three inches deep. Some of the colonies must have numbered thousands of plants.

During the past two years I have made the following observations: They seem to grow most luxuriantly in a black, tenacious soil mostly but a few inches deep, on ledges of limestone which buttress all these hills at about 1000 feet and lower, though there are many colonies growing in the loose, friable stony soil of the higher elevations. A number of plants which I transplanted to the garden (1200 ft) have been doing well for two years. The territory studied so far is about 3 miles long by two miles wide and includes high ridges and deep mountain stream ravines. They were found at elevations from 800 to 1200 feet.

In the area described they occur literally by thousands. I dug up large numbers of plants in several of the colonies and found them often connected by long, slender horizontal, often much-branched rootstocks, forming such a dense network that it was difficult to

separate out unbroken specimens. On some of these there would be plants in several stages of development, some just starting, with a minute fascicle of roots and a mere spot of a bud, to fully mature plants.

In many of the colonies the fronds appear only singly; in others in pairs only; while in other groups both styles occur.

In most of the colonies the fertile fronds are rather rare, not more than one in a hundred bearing the fertile spike.

Sometimes both fronds of a pair will be fertile, occasionally but one, and there were colonies in which every frond was fertile—while in others only the paired fronds were fertile.

Almost without exception where the plant has but one frond, there is a large, well-developed bud close by on the crown, and, also, where there are two sterile fronds the bud is often present; I have never, however, found the bud on those plants which bore two fertile fronds.

I also note that several large colonies which in 1916 produced a large number of paired fruiting fronds have very few fertile fronds this year. I dug up a lot of plants from one of these colonies, and found many of them without fronds at all, and with no visible bud on the crown, though the root-system seemed to be healthy enough.

In the drier situations the fronds are longer and more slender in proportion to those in places more uniformly moist, these latter being thicker and broader, and looking like a different plant.

I have found a few plants well advanced in February; while the great host of plants has its growth and development from the middle of April until the end of May; I have found mature plants in April, in June, in July, and in September and October.

In studying the plant with the upper side of the frond toward me I noticed that the fertile stem did not seem to occur in the middle of the base of the sterile segment, but was adherent to it on the left for about an inch. Of 700 specimens examined in the field, *six* were found to be in the exact center, *none* adherent on the right.

NOTCH, STONE Co., Mo.

More Pleasures from Old Fields

H. E. RANSIER

Much that appeared in the previous article relating to the hart's tongue fern and its variations might apply equally well to the walking fern, but because the latter is so common, nearly every one has had opportunities of becoming familiar with it.

On account of its small fronds and its habit of growing so thickly in beds together, it requires a closer and much sharper inspection to detect variant forms, than does its more favored and thriftier growing relative, the hart's tongue.

I certainly enjoyed *discovering* accidentally my first walking ferns, more than I did my finding the hart's tongue where I knew others had done so before me. And the first ones grew within sight of my place of business and barely outside the corporation limits, in a little glade locally known as "Ewer's Gulf," scarcely an eighth of a mile long, yet a rarely failing source of pleasure for a ramble any day.

Walking ferns are so widely distributed and common that nearly every one has an opportunity to observe the variant forms, and as the fronds are not affected by much of anything except a severe drought, they may be found at all seasons of the year.